# MARINE REVIEW.

VOL. XVII. CLEVELAND, O., APRIL 7, 1898. No. 14.

## Lake Freight Matters.

Ore shippers who have been offering only 45 cents on Escanaba season contracts have not covered as yet more than 200,000 tons at that figure. About seven boats, all of medium class, are involved in these contracts, and in nearly all cases they are to carry Lake Michigan coal on up-bound trips at 25 cents. The early movement of grain carriers out of Chicago will have a damaging effect on the lake freight market until such time as all of the ore shipping ports are open and ore is moving freely. Return coal cargoes are sought for all vessels of the grain fleet, and they would freely accept 20 cents on coal to Lake Superior ports, but there is little coal to be had at any price as yet. In the scramble to get ore cargoes, it is quite certain that the opening rates will be low, and if vessels are crowded onto the market, it would not be surprising to find shippers offering only 40 cents from Escanaba. Two small blocks of ore to be moved from Marquette to Ohio ports have been covered at 55 cents to Nov. 1.

Cold weather in the Lake Superior region during the past week will undoubtedly delay the plans of vessel owners who had figured on sending their ships to Lake Superior immediately after making one Lake Michigan trip. J. W. Corea and M. Schrank, in charge of ore docks at Ashland, are both of the opinion that it is not at all probable now that navigation at that port will open before April 25. Freezing weather has given ice in Chequamegon bay a new lease of life. Several vessels that wintered at Duluth and Superior, where they were undergoing repairs, have been sent to Two Harbors for ore cargoes, but it is not probable that any of the vessels at the head of the lakes will be ordered down until a passage through the Sault river is assured.

Executive officers of the Lumber Carriers' Association are proceeding cautiously and they seem to have the affairs of the organization fully in hand. Additional tonnage has been entered on the books of the association within the past few days, and it is confidently expected that the minimum rates, which are entirely fair, will be maintained.

## Another Ship to be Built at Lorain.

Mr. A. B. Wolvin of Duluth, and his associates in the vessel business, who were figuring with lake builders for another large steel freight steamer, have decided not to build. Announcement may now be made, however, of another contract for a steel steamer, which was closed several days ago by the Cleveland Ship Building Co. The vessel is for the Northern Lakes Steamship Co. of Detroit and will be 414 feet keel, 432 feet over all, 50 feet beam and 28 feet depth. Engines will be triple expansion, having cylinders of 22, 35 and 58 inches diameter with 40-inch stroke. Boilers will be cylindrical, 13 feet 2 inches diameter and 11 feet 6 inches long, fitted with Howden hot draft and built for a working pressure of 165 pounds. The principal owners of this new vessel were in control of the Progress Transportation Co., organized some time ago to operate the wooden steamer Progress. The Progress Transportation Co. is now controlled by J. G. Keith and others of Chicago. The new vessel will be built under the inspection of Robert Logan of Cleveland. With this order under way there will be four steamers building at the Lorain yard. They will represent a combined investment of more than $750,000.

There are some vessel owners who are of the opinion that if the three new lake revenue cutters—Gresham and two vessels building at the Globe works, Cleveland—are sent to the Atlantic coast as a result of the Cuban troubles, they will never be returned. During the late war six schooner cutters were sent from the lakes to the seaboard and were not returned. They were twin vessels, built at Milan, O., about 1859, and named for the members of President Buchanan's cabinet. If the present difficulties with Spain are not settled within the next two weeks the order to send the Gresham and her two sisterships to the coast will undoubtedly be carried out, but it would seem that they should be returned to the lakes when the trouble is over, as a new fleet of cutters for both the Atlantic and Pacific coasts is gradually being secured. The sundry civil appropriation bill, now approved by both houses of congress, makes provision for three first-class cutters and two of smaller class, all for coast service. One of the first-class cutters for the Pacific (Columbia river and Puget sound) is to cost $250,000. The other two, costing $160,000 each, are to take the place of the Seward on the Gulf of Mexico and the Colfax at Charleston. The two smaller vessels are for harbor service at Boston and Philadelphia and are to cost $45,000 each.

A navy board in session in New York sent to President McKinley, a few days ago, the names of ten steamers belonging to coast lines which were selected as auxiliary cruisers, and it is now announced that four of these vessels—El Rio, El Norte, El Sol and El Sud—all of the Morgan line, have been purchased by the government. The Morgan boats are vessels of the first class and well adapted for naval purposes. The other ships in the approved list are the Jamestown, the Yorktown and Princess Anne, of the Old Dominion line; the Red D liners, Caracas and Venezuela, and the crack Savannah liner Kansas City. It is thought that these latter vessels will also be transferred to the government before the close of the present week. These ten steamships are all steel. They have been selected from a list of about 100 coast vessels. They have been constructed within the last few years in American ship yards. They represent a total tonnage of 36,487, the Morgan vessels averaging 4,600 tons each, the Old Dominion liners nearly 3,000 tons each, the Red D steamers 2,700 tons each, while the Kansas City is registered at 3,679 tons. There are no orders as yet regarding changes to be made in the vessels to fit them for war purposes, and it is probable that nothing will be done in this regard until peace measures with Spain are finally exhausted.

## Appropriations for the Lakes.

Although no river and harbor bill will be passed by the present congress, there are appropriations for the lakes in the sundry civil bill amounting to $2,976,484. These are largely for continuous contract improvements in harbors of the leading lake cities, but there are also a large number of important items for the light-house service. This bill is now practically through both houses, so that there is no further question about the lake appropriations. Unfortunately, the officers of the Lake Carriers' Association were unable to secure in this bill a clause setting aside a special appropriation for gas buoys for the lakes, but they are assured through Senators McMillan and Hanna that a liberal share of the $550,000 appropriated for buoyage service throughout the country will be devoted to this purpose. The bill contains an item of $85,000 for a new light-house tender for the lakes. There are also items providing $15,000 each for new light-house depots, one to be located in the vicinity of the Straits and the other at Sault Ste. Marie. Following are lake items in the bill that have received the approval of both houses, and which will probably not be changed in any way in conference:

Light-house service.—For construction of new light-house tender for lakes, $85,000; steam light-ship for Poe reef, Straits of Mackinac, $15,000; Grand Traverse (Cat Head), Lake Michigan, fog signal, $5,500; South Milwaukee, Lake Michigan, light station, $7,500; Tail point, Wisconsin, for moving station to a point near the channel, head of Green bay, $7,500; Ludington, Mich., keeper's dwelling, $3,000; depot for ninth light-house district, near northern end of Lake Michigan, $15,000; light and fog signal station to mark outer end of main channel, entrance to Toledo harbor, Lake Erie, $75,000, of which $37,500 is appropriated at once; keeper's dwelling for Grassy island range light station, Detroit river, $5,000; keeper's dwelling for Grosse Isle, north channel, range light station, Detroit river, $3,500; keeper's dwelling for Grosse Isle, south channel, range light station, Detroit river, $5,000; additional lands for Cheboygan river front range light station, Straits of Mackinac, $1,750; light and fog signal station to mark new 20-foot channel, Lake St. Clair, $20,000; light to mark turning point in channel through Mud lake, St. Mary's river, $3,500; head of St. Mary's river, additional range light to mark channel at entrance to river, $1,000; depot for eleventh light-house district, to be located in vicinity of Sault Ste. Marie, $15,000.

River and harbor improvements under continuous contracts.—Buffalo, $489,746; Duluth and Superior, $770,138; Chicago river, $400,000; Cleveland, $300,000; water communication across Keeweenaw point, Lake Superior, $450,000.

Miscellaneous.—For Deep Waterways Commission (survey of ship-canal from lakes to Atlantic tidewater), $225,000, said commission to make a full report of its proceedings to congress at commencement of its next session; for printing and issuing lake charts by army engineer corps, $3,000; for additional surveys and correction of plates for lake charts, $25,000.

Marine hospitals.—Improvements in marine hospital at Chicago, $37,350; marine hospital at Cleveland, $8,000.

## Cost of Unloading Iron Ore.

In answer to the request of vessel owners for a reduction in the charge that is made at Lake Erie ports for unloading iron ore, the dock managers claim, in effect, that their property is being operated to some extent at a loss under the present labor cost. The dock managers, who met in Cleveland a few days ago, decided to continue last year's charge to the vessels and to pay to the men the same wages that prevailed last year. In support of this position the following statement was made:

"The request of the vessel owners for a reduction is reasonable, in view of the reduced lake freights inaugurated at the opening of the present season, but the dock managers find that they cannot fairly ask their men to work for less wages than prevailed in 1897. They find, also, from returns made since the close of navigation, that in some cases the cost to the docks for doing this work ranges from ½ to 1 cent per ton more than the charge made to vessels. It was clearly shown from these reports that the docks could not afford to stand any further reduction themselves. In fact, it seemed more reasonable to ask for an unloading charge at least equal to the cost. However, after discussion, it was decided to let last year's prices and wages stand. Meantime there is to be a closer comparison of costs, and it is not unlikely, if the same condition is found to prevail another year, that the unloading charge will be fixed at least equal to the cost of doing the work. Last year, when the vessel interests requested and were given a reduction in their unloading charge, the dock companies decided that they could only slightly reduce the wages of their men, and consequently stood most of the reduction themselves, with the result that it has since been found that they have been doing the work for less than cost."

The North German Lloyd steamer Kaiser Wilhelm der Grosse has again lowered the record from Southampton to New York. She arrived in New York on the 6th inst., having made the passage in 5 days and 20 hours, which is 2 hours and 35 minutes less time than her best previous record from Southampton, which was made on her maiden trip in September of last year. On that trip she covered a distance of 3,050 knots, at an average speed of 21.39 knots. On this last trip she covered 3,120 knots, increasing her average speed to 22.29 knots.

Following the arrival of Charles H. Cramp at St. Petersburg, March 28, it was again announced that the Philadelphia ship builders are to have contracts for three or four of the new war vessels for which large appropriations were recently made by the Russian government.

## The Republic to Build Steamships for the World.

When Mr. W. I. Babcock, general manager of the Chicago Ship Building Co. returned to this country, a few months ago, after a visit to ship yards in England and Scotland, in connection with the International Congress of Naval Architects and Marine Engineers, he wrote a short letter to the Review in which ship building methods in England and in this country were compared, and in which Mr. Babcock concluded that if modern ship building plants in this country had business to insure steady employment they could build vessels cheaper than they are now built in any country in the world. Our main advantages over England, according to Mr. Babcock's conclusions, were cheaper material, more general use of labor-saving machinery and freedom from labor-union rule of our ship yards, which results greatly to the disadvanatge of English yards. A copy of this letter was sent by a Cleveland gentleman to Andrew Carnegie in France, immediately following the publication of Mr. Carnegie's letter suggesting the advantages of a big ship building plant somewhere in the vicinity of New York harbor. An acknowledgement from Mr. Carnegie indicates that he is deeply interested in the subject of ship building in this country. He says he considers Mr. Babcock's letter sound in every particular. "We shall not have long to wait," he says. "The Republic is to build steamships for the world."

English trade journals do not, of course, agree with Mr. Carnegie on the seat of future ship building supremacy. It is claimed, for instance, on the other side, that the problem is not one of a mere matter of prices and wages, but that it is also a question of possession of special knowledge of a highly technical art. The advantages which the British ship builders possess in the experience gained through generations of special craftmanship, the world-wide extent of British commerce and the requirements which it originates, and the enormous needs of the British merchant marine itself, are all factors governing and likely to govern the ship building interests of the near future. The British papers admit that we have the cheapest pig iron in the world, but they do not admit that the prices given by Mr. Carnegie of the cost of ship plates in Great Britain are correct. It is pointed out that we do not at the present produce ship plates to any large extent. Doubt is expressed as to whether the demand for ships from the United States would keep many ship yards going in this country, but with regard to the question as to whether American ship builders can build sufficiently well and cheaply to secure foreign orders, British confidence is not so strong. In fact, one British iron-trade paper says: "In the face of the recent success of the United States in securing orders for other manufactures we should not feel justified in entering a non possumus. The potentialities of the situation have been outlined by a man who knows better than most men what he is talking about, and they are not without menace to the future of our great ship building industry."

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The steamer New York, building at Buffalo for the American line St. Lawrence river service, is nearing completion. She will be one of the finest steamers ever seen on the St. Lawrence, and will probably attain a speed of 20 miles an hour. With the steamer Empire State she will furnish daily service from Clayton to Montreal in connection with the New York Central & Hudson River Railroad.

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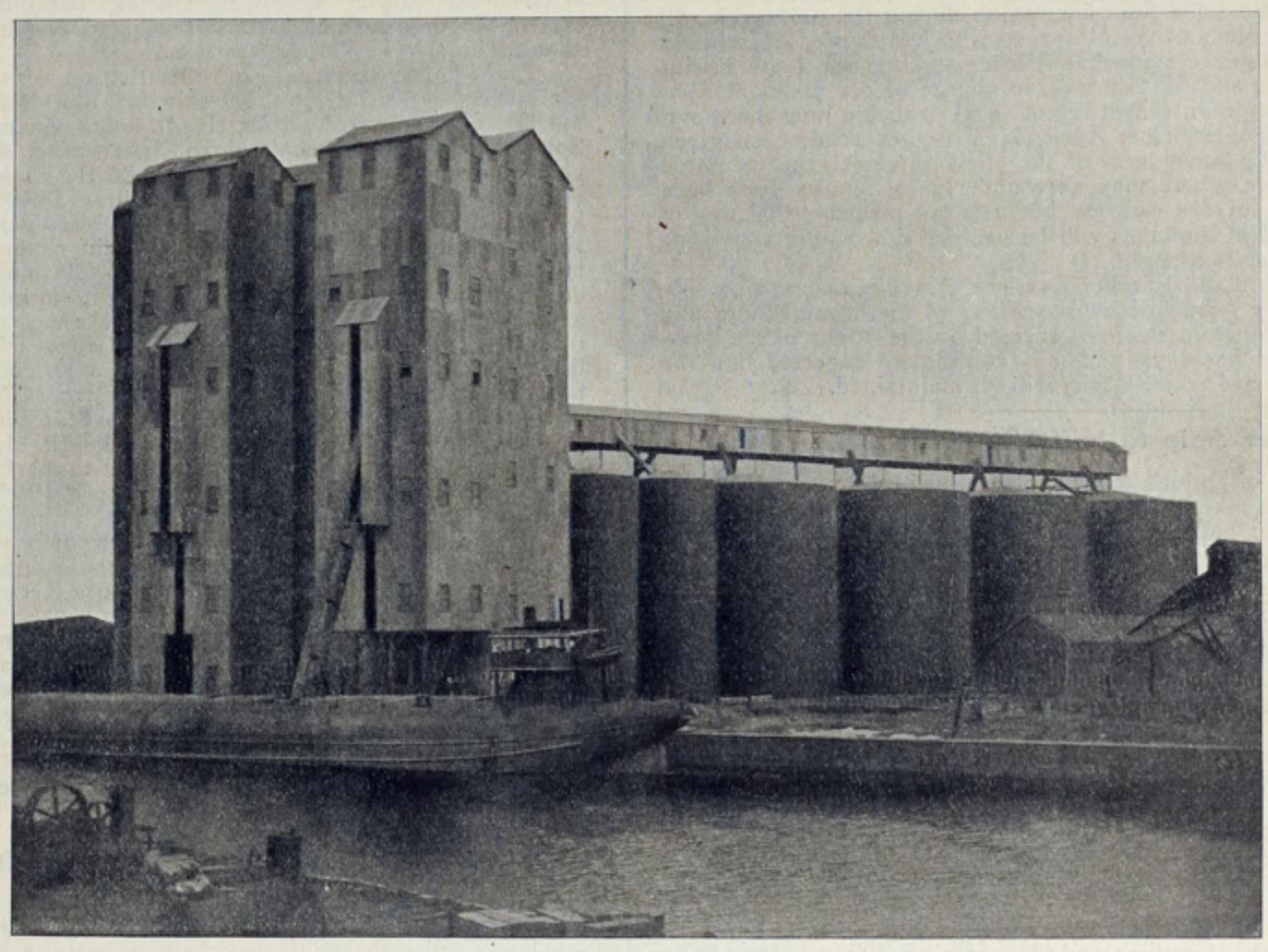
## The Extraordinary Demand for Steel.

The pressure on steel works for billets and sheet bars is one of the conspicuous features of the iron trade of the West. It has continued so long that the fact is thoroughly established that a shortage exists in converting capacity—which means, of course, a shortage in the capacity to produce steel at prevailing prices. We have a considerable number of idle Bessemer and open hearth plants, usually of small size, which are figured in as part of the assets of certain properties, some of which might be operated if prices should materially advance, but they are at present out of the race, and perhaps all of them might be considered permanently out. With the heavy demand for steel now being felt, if there was half a chance of making a mere margin they would be started. Steel companies are buying from one another to satisfy consumers whose requirements they are under contract to meet, and consumers are likewise drawing on distant concerns for their supply, because home producers are too busy to risk taking further orders. During the existence of the steel billet pool, some two years since, the stimulus given to the erection of competing plants was viewed with apprehension by those who were not merely seeking for immediate and temporary benefits. For a short term thereafter it did appear as if excessive competition had thus been invited. But the country has grown beyond the capacity thus provided, and a veritable steel famine would be in existence at this time but for those additional plants. As it is, consumers here and there are obliged to run their works more or less intermittently on account of the irregularity with which they receive a supply of billets. The heavy pressure for steel comes partly from the increased quantity now being finished by the steel works themselves and partly from the growth in the demand for the products of mills not making their own steel. The new additions to steel converting capacity which are under way or projected in the Pittsburgh district may not all be needed, but room certainly exists for a considerable expansion.—Iron Age.



THE ELECTRIC GRAIN ELEVATOR, BUFFALO, 1,000,000 BUSHELS—DESIGNED FOR FUTURE CAPACITY OF 4,000,000 BUSHELS.

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## Nautical School Prizes.

Editor Marine Review:—I have the honor to report the following successful candidates in the examination for the Great Lake Register prizes, held at the Chicago Nautical School March 26, 1898. Captain F. D. Herriman finished the papers and handed in the names of the prize winners on last Wednesday evening. He was very much pleased with the examination papers. Thirty-seven questions covering the first course were given. The names and prizes won are as follows: Capt. Donald MacLean, $50, first prize for captains; Capt. Geo. Hammer, $25; Capt. K. A. Jensen, $25; Capt. Wm. Brown, $25; Wheelsman Edward Boyne, $50, first prize for mates and wheelsmen; Mate Albert Swansen, $25; Wheelsman Phil. Sheurmann, $25; Wheelsman C. A. Shepard, $25.

The school proved very successful this winter, having a class of twenty-two. It is believed a large number will take the course next winter.

W. J. WILSON,
Principal.

Chicago, April 4, 1898.

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Sommers N. Smith, who has been general superintendent of the Newport News Ship Building & Dry Dock Co. for the past seven years, has secured a controlling interest in the Neafie & Levy works, Philadelphia, and will assume the management of that concern in the near future. Mr. Smith has been succeeded by Walter A Post, who has been identified with the Newport News plant since its establishment. George F. Clark, superintendent of construction, has also resigned, and will be succeeded by M. V. D. Doughty.

## Modern Steel Elevators for Lake Grain Trade.

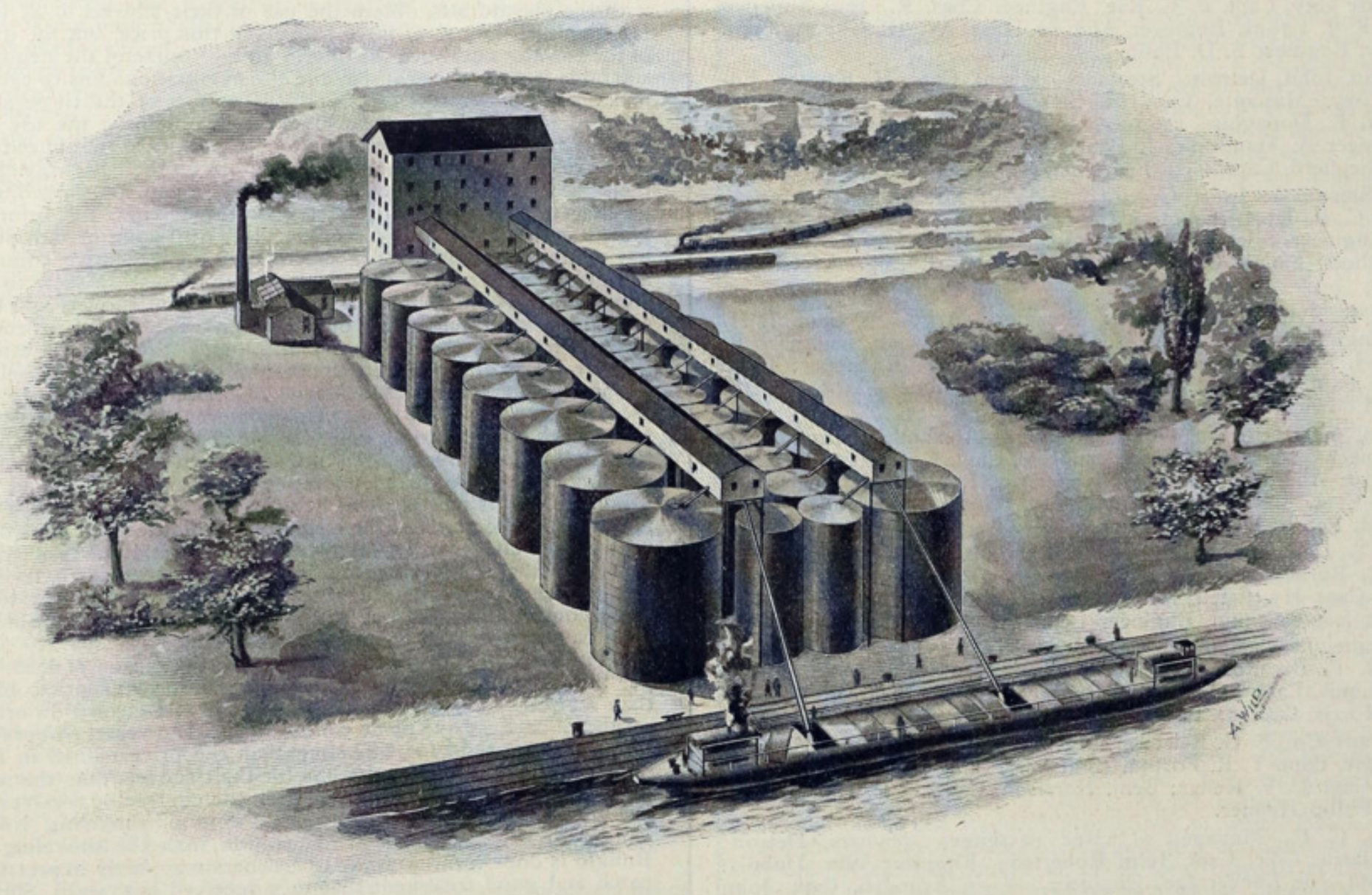
Views of steel elevators of the kind that are gradually replacing wooden structures in leading grain ports of the lakes are presented on this and the opposite page. The Canadian Pacific elevator at Fort William, Ont., receives from cars and ships into boats. This structure is not as yet complete, but will be in time to secure a large part of the grain business of the northwest during the coming season. The Electric elevator at Buffalo, a view of which appears on the opposite page, receives from boats and ships into cars and canal boats. This elevator was built by the Steel Storage & Elevator Construction Co. of Buffalo, which firm is also engaged in putting up the larger structure at Fort William.

The Canadian Pacific Co. handles from 25,000,000 to 40,000,000 bushels of grain yearly at Fort William. The grain comes from the Manitoba grain fields by rail and is transferred to vessels at Fort William for shipment to eastern points. The Canadian Pacific now has three wooden elevators, each holding 1,250,000 bushels, at Fort William. The new elevator is all steel and has a capacity of 3,000,000 bushels. The contract for this elevator was let last August by P. Alex. Peterson, chief engineer of the Canadian Pacific. He insisted that the new elevator should be fire-proof with air-tight tanks for storing the grain. No insurance will be carried and hence the saving in seven years will about pay the first cost of the elevator.

The greater and most important feature of steel elevators, however, is the separation of the storage department from the machinery for weighing and transferring grain. This allows the construction of separate tanks of various capacities to suit any condition. The tanks are constructed of homogeneous steel, and by close riveting an air-tight tank is obtained. While air is essential to the life and growth of vegetable matter it forms, at the point of maturity in grain, the direct and active agent that not only induces fermentation but begins decay. The theory for counteracting the deleterious influence is to enclose these products at maturity in steel tanks, from which the common air may be excluded. By common air is meant the free atmosphere, composed of about 22 parts oxygen and 78 parts nitrogen, reposing or existing in various degrees of density and temperature. It is only necessary to shut these products from contact with this free, common air, because they have within themselves the means of their own preservation, and the destroying influence of the air that may be contained within the steel tank is counteracted by the admixture of the elements from the products in store, for when common air, by the admixture of foreign gases, is changed in composition, it is as harmless to destroy as it would be impotent to aid the growth of these products. Air-tight tanks prevent mixing, heating, rotting or shrinking of grain in store. The expensive process of airing and cooling the grain is abolished and there is no opportunity for ravage of weevil, rats or thieves.

The Canadian Pacific experts hence insisted on air-tight tanks. Their elevator building proper is built of structural steel, with one quarter-inch steel plate floors, supported on "I" beams, the steel frame being covered with heavy corrugated steel. It contains the scales, steel circular garners, steel elevator legs, power shovels, car-pullers, warehouse, separators, steel spouting transmission machinery and fixture for the weighing and transferring of grain from cars to tanks or direct to vessels. Two belt galleries run over the tops of the tanks. They are built of steel and contain two belt conveyors, each with trippers for distributing grain to the various tanks, or direct to vessels. The shipping capacity is 40,000 bushels per hour. The unloading capacity is 400 cars per day. The boiler and engine-house is built of Lake Superior stone, with steel truss roof, and contains one 400 horse power condensing engine; three boilers, 66 inches by 16 feet, with all the necessary pumps and fixtures. The power is transmitted from the engine to the steel house by a 400-horse power manilla rope drive. Tunnels constructed of stone under the tanks contain the belt conveyors for transferring the grain from the tanks to the steel building, where the grain is weighed and shipped to vessels by means of the conveyors in the steel galleries over the tanks; dock-spouts being attached to the end of the galleries for receiving the grain from the belt conveyors. There are sixteen steel tanks, 58 feet in diameter by 60 feet high, and thirty-two tanks 29 feet in diameter by 60 feet high. The tanks are ranged side by side, the smaller tanks in a double row, flanked on each side by a row of eight big tanks.

The Electric elevator at Buffalo, built during 1897, is the first elevator designed to make commercial use of Niagara power. It stands on Buffalo river about 500 feet east of the Ohio street bridge and has storage capacity of 1,000,000 bushels. It is built on the natural rock, which is found only 7 feet below the average water level. This condition was the chief reason why this site was selected, inasmuch as there can be no settlement. The main building and marine towers are constructed entirely of steel, the floors being ⅜-inch plate. All the machinery in the structure is supported on steel girders, and the elevator legs, scale hoppers and garners are all built of steel. The plant consists of a structural steel building 38 feet by 126 feet by 146 feet high; a stationary and movable tower of steel 28 feet by 32 feet, each 146 feet high; a steel belt gallery over top of tanks 17 feet wide, 204 feet long, 80 feet above the ground, and a series of nineteen immense steel grain tanks. Seven of these tanks are of 100,000 bushels capacity each, and the other twelve tanks are of 25,000 bushels capacity each. Four of the smaller tanks are subdivided into four bins of about 6,000 bushels each. All the tanks are air-tight and fire-proof, and all have self-cleaning hopper bottoms.



CANADIAN PACIFIC RAILWAY CO.'S STEEL ELEVATOR, FORT WILLIAM, ONT., 3,000,000 BUSHELS.

As the storage of all the grain in tanks is independent of the main building, there is practically no annoyance from dust. All the grain is weighed in the main building and not in the towers, thereby giving plenty of room in the marine towers and assuring accurate working of the scale, as scales in movable towers are continually getting out of order.

Niagara power enters the elevator on three wires. The transformers are of the self-cooling type, and reduce the pressure from 2,200 volts three-phase to 200 volts two-phase. At this pressure the current is supplied to motors varying from 40 to 75 horse power each in capacity, and having an aggregate capacity of 450 horse power. Motors are of the Tesla induction type. Although the storage capacity of this elevator is only 1,000,000 bushels, the site, steel buildings and machinery are large enough to allow an increase of tanks, so the future capacity will be 4,000,000 bushels. The receiving capacity from vessels is 24,000 bushels per hour, and the shipping capacity to canal boats or cars is 20,000 bushels per hour.

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Egbert P. Watson, who is well known to marine engineers throughout the United States on account of long connection with the Engineer of New York, recently began the manufacture and sale of a patent water tube boiler. It is known as the Watson radial water tube boiler and is highly spoken of by engineers whose judgment is valuable. A catalogue descriptive of the boiler is concise and plain, both as regards reading matter and illustrations, and it contains many pointed statements characteristic of the inventor. It is understood that Mr. Watson will give entire attention to this new enterprise. He is deserving of success and should certainly have the support of the marine engineers whose cause he has championed in all matters for a great many years.

## Appointments of Captains and Engineers.

Gilchrist, F. W., Alpena, Mich.: Steamers—Viking, Capt. H. Richardson, Engineer Robert Leitch; Norseman, Capt. H. L. Foster, Engineer Thad. Kneal; S. C. Hall, Capt. Henry Bennett, Engineer S. Richards; Garden City, Capt. James Brines, Engineer Harry Parker. Tugs—John Owen, Capt. Thomas Lillis, Engineer David Thompson; Frank W., Capt. John Lawson, Engineer Byron Persons; Ralph, Capt. James Putman, Engineer Antoine Dennie; Arthur D., Capt. John Kenyon, Engigineer Samuel Kissick. Schooners—Vinland, Capt. Charles Hanson; Nellie Mason, Capt. J. B. Mitchel; Sam. Flint, Capt. Thomas Stephens; Russian, Capt. James Hamilton; Light Guard, Capt. James Hanson; S. H. Lathrop, Capt. Joseph Cota; Knight Templar, Capt. Hugh G. Hamilton; J. B. Kitchen, Capt. Oscar H. Brown; Ida Keith, Capt. Philip De Roy.

Booth Packing Co., A., Chicago: Steamers—Hiram R. Dixon, Capt. J. F. Hector, Engineer J. E. Evans; Hunter, Capt. A. Clausen, Engineer Geo. Belloir; William Maxwell, Capt. H. C. Plum, Engineer Joseph Martin; F. R. Anderson, Capt. Thos. Hodland, Engineer Thos. Lindland; R. W. Currie, Capt. Chas. Noggelgard, Engineer Freeman Briggs; T. H. Camp, Capt. John Swaras, Engineer Geo. McNeal; Oval Agitator, Capt. Frank Bordash, Engineer Wm. Bogel; Valiant, Capt. Dan'l F. McCauley, Engineer Edward Hogarty; City of Green Bay, Capt. Benjamin Lewis, Engineer Fred. Larson.

Wolvin, A. B., Duluth, Minn.: Steamers—Zenith City, Capt. F. P. Houghton, Engineer T. Francombe; Queen City, Capt. Geo. Bell, Engineer Wm. Most; Crescent City, Capt. H. L. Mills, Engineer Geo. Lawrence; Empire City, Capt. F. C. Rae, Engineer Chas. R. Ogg; Superior City, Capt. R. J. Lyons, Engineer Andrew Hass; W. H. Gilbert, Capt. R. J. Cowley, Engineer F. D. Philp.

Stevenson, John, Detroit: Steamers—Miami, Capt. H. Huyser, Engineer J. Elsey; Mascotte, Capt. N. Stewart, Engineer H. Morrison; Hattie, Capt. E. Donaghue. Engineer E. Hayward; Bessie, Capt. Wm. Jaack, Engineer A. Hamilton; J. Pauly, Capt. F. Forest, Engineer M. Roath; S. Shepherd, Capt. Geo. Ferguson, Engineer W. Stackhouse.

Hart's Steamboat Line, Green Bay, Wis.: Steamers—Eugene C. Hart, Capt. C. B. Hart, Engineer George Coulter; Welcome, Capt. P. Rowlette, Engineer Jules Schram; C. W. Moore, Capt. Ed. W. Hart, Engineer Elliott; Fannie C. Hart, Capt. H. W. Hart, Engineer D. McLennan.

Mills, J. E., Port Huron, Mich.: Steamers—Argonaut, Capt. J. H. Warwick, Engineer ———;N. Mills, Capt. Dan. Warwick, Engineer B. Hansen; H. J. Kendall, Capt. H. J. Kendall, Engineer E. Steger; T. R. Scott, Capt. Paul Rivard, Engineer ———. Schooner—Montgomery, Capt. Chas. Ludwick.

Hepburn, A. W., Picton, Ont.: Steamers—Alexandria, Capt. E. B. Smith, Engineer Chas. McWilliams; Empress, Capt. Geo. O'Brien, Engineer M. Tetro; Aberdeen, Capt. M. Heffernan, Engineer F. Thercauld; Water Lily, Capt. M. Hicks, Engineer Geo. Gown. Schooners—Rob Roy, Capt. H. Peron; Delaware, Capt. ———.

Hurley, T., Detroit: Steamer—Majestic, Capt. M. G. McIntosh, Engineer C. H. Burke. Schooners—Reuben Doud, Capt. A. E. Bullock; Mystic Star, Capt. Hy. Estell; Mongangon, Capt. M. J. McNamara. Tug—Erie, Capt. Louis Sequin, Engineer Peter St. Onge.

Crosthwaite, J. L., Buffalo: Steamers—Niagara, Capt. W. J. Lynn, Engineer W. P. Boynton; Cormorant, Capt. David Carrier, Engineer ———; St. Louis, Capt. John Milne, Engineer Dennis Struble. Schooners—A. B. Norris, Capt. D. O'Hagen; Champion, Capt. W. J. Munroe.

Olga Trans. Co., E. G. Reisterer, Mgr., Tonawanda, N. Y.: Steamer—J. C. Pringle, Capt. T. R. Forton, Engineer Frank Whittier. Barges—Sweetheart, Capt. C. F. Kellar; Benj. Harrison, Capt. C. C. Hanly; Unadilla, Capt. Philip Hepner.

Bielman, C. F., Manager of river passenger steamers, Detroit: Steamers—Darius Cole, Capt. John Robertson, Engineer Wm. Dubois; Idlewild, Capt. Joe Lockeridge, Engineer ———; Arundell, Capt. John Stover, Engineer C. H. McCarter; Florence B., Captains Nels. Helger and Edward Baker, Engineer Edward Lewis.

Cummings, M. J., Oswego, N. Y.: Steamers—C. S. Parnell, Capt. P. J. Griffin, Engineer Thomas Durkin; Monteagle, Capt. Wm. Griffin, Engineer M. Larson.

Great Northern Transit Co., Collingwood, Ont.: Steamers—Majestic, Capt. P. M. Campbell, Engineer J. W. Aston; Pacific, Capt. R. D. Foote, Engineer J. Aston; Atlantic, Capt. James Wilson, Engineer F. Cleland; Northern Belle, Capt. C. Jacques, Engineer S. Burgess.

Cook, W. H., Vessel Agent, Chicago: Steamer—Westover, Capt. J. H. Madden, Engineer J. Seymore. Schooner—Bliss, Capt. J. Hansen; Parana, Capt. J. Duncan.

Graham & Morton Trans. Co., Chicago: Steamers—City of Chicago, Capt. Charles McIntosh, Engineer Wm. McClure; City of Milwaukee, Capt. John Stewart, Engineer Chas. L. Barron; City of Louisville, Capt. Wm. A. Boswell, Engineer W. F. Johnson.

Jenks Ship Building Co., Port Huron, Mich.: Steamers—Black Rock, Capt. Geo. McLeod, Engineer A. Armson; Linden, Capt. W. H. Lanake, Engineer P. Trevelans; H. E. Runnells, Capt. J. E. Reynolds, Engineer A. Jameson; L. S. Porter, Capt. M. Madden, Engineer Flanigan. Schooners—Brainard, Capt. W. E. Donley; A. C. Maxard, Capt. Jas. Hall.

Smith, P. C., West Bay City, Mich.: Steamer—M. E. Kelton, Capt. S. M. Powrie, Engineer Eugene Hidden. Schooners—Allegheny, Capt. J. H. Emery; Active, Capt. Chas. Phelps.

Mitchell & Co., Bay City, Mich.: Steamer—A. Folsom, Capt. George H. Phelps, Engineer Geo. Coveo. Schooners—May B. Mitchell, Capt. S. L. Ketchum; Nelson, Capt. F. V. Specht.

Livingstone, Wm., Detroit.: Steamers—Thos. W. Palmer, Capt. George F. Stilphen, Engineer Robt. B. Hodge; Livingstone, Capt. William McAlpine, Engineer Alex. Morison.

McLachlan Transportation Co., Port Huron, Mich.: Steamer—K. M. Forbes, Capt. James Montgomery, Engineer Charles Hilling. Schooner—M. E. McLachlan, Capt. George Fuller.

Pierce, W. E., West Bay City, Mich.: Steamer—Benton, Capt. Wm. E. Pierce, Engineer A. P. Hagadon. Schooner—H. Bissell, Capt. H. A. Pierce.

Allen, Luther, Globe Iron Works Co., Cleveland: Steamer—Globe, Capt. A. C. Chapman, Engineer Charles Rice.

Charlevoix Lumber Co., H. Nicholls, Mgr., Charlevoix, Mich.: Steamer—Pine Lake, Capt. Eph. S. Small, Engineer John Chemock.

Bennett, Geo. J., Port Huron, Mich.: Steamer—Cleveland, Capt. Geo. J. Bennett, Engineer Harry Wolf.

McCormick, L. H., Marinette, Wis.: Steamer—S. J. Murphy, Capt. Alex. Beggs, Engineer N. P. Slater.

## Official Notice Regarding Grain Shoveling.

To the Members of the Lake Carriers' Association:—I am directed by the executive committee of the association to inform you in detail of the condition of the grain shoveling problem at the port of Buffalo. At the annual meeting of the association it was voted to give a contract for all the grain shoveling at Buffalo to Mr. W. J. Conners at the price of $2.95 per thousand bushels, a reduction of 40 cents per thousand bushels from the contract price of last season. Of the $2.95 to be paid to Mr. Conners, he was to pay $1.85 per thousand to the grain shovelers for their manual labor, $1 per thousand to the elevators for the use of their steam shovels, leaving a profit of 10 cents per thousand bushels for himself. After obtaining the contract at Detroit, Mr. Conners opened negotiations with the elevators to obtain the use of their shovels at $1 per thousand. He obtained the use of three shovels at this price, but the great majority of the elevators declined his offer. In the course of the negotiations, considerable feeling was aroused, and the negotiations finally came to a deadlock, Mr. Conners having obtained the use of the three shovels above referred to, with little or no prospect of obtaining the use of any other shovels at his figures. The contractor then openly announced his intention to shovel the grain by hand; the elevators on their part openly announced their intention to abandon the contract system of shoveling, which has given great satisfaction to vessels for three years, and return to the old system under which each elevator had its own gang of shovelers. Matters having reached this state, a meeting of the executive committee of the association was held at Cleveland March 22, with a view to some settlement which would lead to the use of the steam shovels and to a continuance of the contract system of shoveling. The elevator owners were also anxious to avoid the difficulties and losses which would attend a failure to arrive at an amicable settlement, and so expressed themselves. A conference was held in Buffalo March 23 between a committee of the vessel owners and elevator owners. This conference led to a free interchange of views, each party learning considerable about the other's feeling and position in the controversy, but no settlement was arrived at. A second meeting of the executive committee was held in Cleveland on Monday, March 28. This meeting was held on short notice, but to it were invited not only the members of the executive committee and the shoveling committee, but all other vessel owners who could be reached. A careful survey of the whole situation induced the meeting to take steps for a further conference with the elevator owners with a view to arriving at some compromise, honorable and fair to both parties. Such a compromise has been arrived at upon the following basis:

The price of shoveling in Buffalo for the season of 1898 is to be $3.10 per thousand bushels. 25 cents less than last year's price, 15 cents more than the price named in the contract made at Detroit. In arriving at this result, all parties have made concessions. The vessel owners pay 15 cents more per thousand for shoveling than the price named in the contract; the elevators receive 15 cents less for their shovels than the price received by them last year and asked this year; the contractor receives only 5 cents per thousand profit; the contract system of shoveling is retained; all danger of labor troubles in connection with the shoveling of grain at Buffalo is done away with; vessel owners may fairly expect the same dispatch and good treatment that they received last year. Should there be in the course of the season a reduction in the charge for the steam shovels below $1.20, the vessels are to receive the benefit.

The executive committee believes this settlement to be more advantageous to the vessels than a protracted controversy with the elevator owners and an attempt to handle the immense grain business at the port of Buffalo by hand. The controversy would have involved vessels and elevators alike in expense, law suits and annoyance. The attempt to do the business by hand would have resulted in serious delays. A condition of ill-will and bad feeling between vessel owners and elevator owners, and to some extent between different members of the Lake Carriers' Association, might and probably would have resulted.

Under all these conditions the executive committee congratulates the members of the association upon the settlement which has been reached. It has been the endeavor of the committee to treat the matter as a business problem in a business-like way. They believe they have done the best that could be done for every member of the association, and they ask your hearty support in the position they have taken.

LAKE CARRIERS' ASSOCIATION.
By JAMES S. DUNHAM, President.
HARVEY D. GOULDER, Counsel.
CHARLES H. KEEP, Secretary.

Office of the Secretary,
Buffalo, N. Y., April 1, 1898.

A note in the last issue of the Review may have conveyed the impression that Mr. W. H. Johnson had not been appointed agent at Buffalo of the Erie & Western Transportation Co. (Anchor line). Such was not the intention of the notice. Buffalo dispatches referred to the appointment in such a way that some people thought Mr. E. T. Evans, western manager of the Erie & Western company, had given up his connection with the line. The intention of the notice in the Review was to correct this error.

The Brown Hoisting & Conveying Machine Co. of Cleveland has received the contracts from the government for the building of eight coal loading machines for four coaling stations on the Gulf of Mexico.

## IMPROVEMENTS IN THE RIVERS.

POINTS WHERE WORK SUPPLEMENTAL TO THE 20-FOOT CHANNEL MUST BE CARRIED OUT—PLANS FOR WIDER AND SAFER BUT NOT DEEPER CHANNELS.

Washington, D. C., April 6.—Some vessel owners of the lakes are opposed to further deepening of channels on account of the effect on their property produced by big ships of deep draft, but they are certainly not in the majority. Secretary Alger of the war department has had in mind since he took charge of that department a scheme of improvement for the lakes that is delayed just now on account of the Cuban troubles and postponement of the river and harbor bill, but which will undoubtedly be carried out later on. The plan is not for further deepening of the lake channels, but rather the process of widening them and rounding off the corners at turns, so as to make them safer. In this matter the secretary some time ago sought suggestions from the Lake Carriers' Association, and the executive officers of that body made a careful investigation of the subject. They would probably not favor a new project for deeper channels, but the supplemental improvements that are necessary for the purpose of perfecting the 20-foot channel project are generally recommended. A letter from the vessel owners to Gen. Alger dealing with these supplemental improvements will prove interesting to readers of the Review. Its main points are as follows:

"It was Gen. Poe's purpose in outlining the 20-foot channel project to get a narrow waterway through the difficult points in the rivers, and he fully understood that in certain places the improvements which he outlined were not final in character, as the channels provided were not of sufficient width for the accommodation of the increasing commerce which passes through them. The existing project calls for a ship canal 20 and 21 feet in depth between Chicago, Duluth and Buffalo, 'with a minimum width of 300 feet.' Where a greater width could be provided within the limits of the estimates which Gen. Poe made, a greater width than 300 feet has been provided. Thus the improvements at the foot of Lake Huron provide a channel 2,400 feet in width. The improvements at the mouth of the Detroit river provide 20-foot channel 800 feet in width. So also at Round island in the upper St. Mary's river, and at Grosse point, the channels are much more than 300 feet wide. At certain points, however, channels only 300 feet in width are being and have been completed under the existing project.

"The Lake Carriers' Association has given this matter careful consideration and has had several interviews with the engineer officers in charge of these important works, with a view to arriving at some project reasonable in cost which might now be adopted as a supplement to the existing project, and which would provide a less dangerous waterway and be more in keeping with the present requirements of commerce. Commencing at the lower end of the Detroit river, we beg to submit the following suggestions showing what we deem to be necessary in the way of further improvements of the channels:

"Lime-Kiln crossing.—The cut at Lime-Kiln crossing is now 440 feet wide with quite a sharp turn at each end, the edges of the cut being of hard and jagged rock. A project should be adopted for widening the cut to 600 feet and for cutting off the angles above and below to a corresponding extent so as to make an easy approach to the cut.

"Ballard's reef.—The present improvement at Ballard's reef consists in cleaning out the boulders from a channel 300 feet in width. The west half of this channel is now cleaned out to a depth of 18 feet. The east half of this 300-foot channel is being cleared out to a depth of 20 feet. A project should be adopted here calling for a channel 600 feet wide and 20 feet deep. This work does not consist of excavating solid rock. The soundings show that most of the 600-foot channel is now over 20 feet deep. The work would consist of cleaning out boulders and small shoal spots. This work is as urgently needed as any on the great lakes. The draft of vessels is now limited by the water at this point, there being more water at all other points in the channel than at Ballard's reef.

"St. Clair Flats canal.—Another 300-foot channel is imperatively needed at this point. It could be constructed just to the west of the old channel with an approach of corresponding width below. The approach above is now of natural deep water of ample depth.

"St. Clair river.—There are a few shoal spots in the St. Clair river which should be cleaned out, especially those in the American channel on the west side of Stag island, and the Middle Ground, which encroaches upon the channel at the mouth of Black river. We understand that under the existing project for a ship-channel 300 feet wide and 20 feet deep, any shoals in the waters connecting the great lakes not specifically appropriated for otherwise, can be cleared out.

"St. Mary's river.—The existing channel by way of the Middle Neebish is of a width of 300 to 350 feet at Sailors' Encampment, Dark Hole and Middle Neebish cut. At the latter place there is an available depth of only 18 feet for a distance of about 2,000 feet. This appears to have been caused by the lowering of the levels of Hay lake through the improvements which have been made to utilize the Hay-lake channel. These channels should all be immediately widened to 600 feet, and the Middle Neebish cut deepened to a depth of 20 feet, or else a new project should be taken up and adopted for the improvement of the channel through the West Neebish. There is no doubt that the latter course would afford a much better channel than could ever be provided through the Middle Neebish, and that a distance of seven miles could thus be saved. This would make a grand improvement in the navigation between Lake Superior and Lake Huron. Down-bound boats could use the West Neebish channel and up-bound craft follow the present channel through the Middle Neebish. Whether the improvement of the West Neebish is undertaken or not, the Middle Neebish for a disatnce of 2,000 feet, where the depth is only 18 feet, should be deepened to 20 feet and widened to at least 350 feet.

"Upper St. Mary's river.—We understand that authority has already been obtained by the engineers to use money now on hand to widen the west approach to the St. Mary's Falls canal at Rock shoal to an approximate width of 1,000 feet.

"These are the points in the waters connecting the great lakes which need further improvement, and as you will perceive, the improvements here stated, are: First, to provide at Ballard's reef and Middle Neebish cut a depth of 20 feet, which is what has been obtained elsewhere and which is called for by the existing project; second, to widen the channels at the Lime-Kiln crossing, St. Clair Flats canal, Dark Hole and Sailors' Encampment, so as to make those channels reasonably safe for the larger vessels now using them and commodious enough to provide for the still further increase in the lake commerce which must be reasonably looked for, and which no one, who, like yourself, is familiar with the history of lake navigation, can doubt."

## Strength of Lake Ships.

Editor Marine Review:—A recent paper read before a prominent engineering society by the manager of one of your largest ship yards, and reprinted in your issue of March 3, makes some peculiar statements in regard to existing lake vessels, criticizes the practice of other yards, and, assuming superiority for its own designs, backs up that assumption by such an apparently convincing array of figures, well calculated to impress the layman's mind, that many owners of modern steel tonnage may well be rendered uneasy in regard to their boats and quite unnecessarily alarmed as to their strength and seaworthiness.

With no disposition to criticize personally the author of this paper, I must beg to differ entirely from both his premises and his conclusions. The paper states that his experience on the lakes has been less than two years. During this period it seems to me that he has entirely missed the genius of lake ship building and failed to comprehend the peculiar conditions governing the business, which have developed a type of construction and arrangement of scantlings different from anything used on salt water, but especially fitted to the work the ships have to perform.

With the rapid increase in size during the last few years, undoubtedly mistakes have been made, both in the designs of the ships and the methods of handling them in service, but on the whole it may be safely said that nowhere in the world have these mistakes been fewer nor more quickly rectified, and that the modern lake freighters are unexcelled in design, materials and workmanship, and durability and lasting qualities in service.

Further: All of these ships, for several years, have been built to the rules and under the rigid inspection of the surveyors of one or more of the great classification societies of the world—English Lloyds, Bureau Veritas, British Corporation, United States Standard, American Shipmasters'—and received, without exception, the very highest class for lake service. It is not within the bounds of reason to suppose that all of these societies, whose rules represent both the theory and the experience of all the experts and practical men of the world since metal ships were first built, have been deficient in their requirements of construction.

It is not my intention to follow the paper into figures, further than to state the well-known fact that exact calculations on the strains experienced by ships are impossible, and that results are relative only. In the cases cited, the figures as given are confessedly based on the vessel in her light condition, without cargo or ballast, at rest in still water. It is far-fetched and may be misleading to attempt to pass from this condition to that of the vessel, loaded or in ballast, in a seaway, nor are results obtained on the assumption that the bending moment is the same, or nearly the same, function of the length and displacement as on the ocean of any value, the wave conditions here being entirely different and the only thing certain being that with our much shorter waves the long ships are strained very much less than the figures indicate.

That the neutral axis of the equivalent girder is low down, which is the great point of the paper, is no evidence whatever of weakness above or bad arrangement of scantlings, and, though seemingly brought forward now as a great discovery, has been perfectly well known for years, and results from entirely natural conditions. The neutral axis is low because the bottom of the ship is heavy, and the bottom is heavy to stand the strains due to the frequent groundings to which lake vessels are liable and the carriage of heavy ore cargoes to a considerable height above the floors. Both these might be called local reasons, as they have little to do with the longitudinal strength as a whole. Recently, to save the expense of frequently replacing wood ceiling in the hold, the wood has been omitted and the tank top has been doubled in thickness, adding perhaps 10 or 15 per cent. to the already excessive bottom strength and still further lowering the neutral axis, yet it would be absurd to add an equal or greater amount to the top chord simply to bring the axis up again and make a diagram look well.

The principal trouble which has been experienced with our ships from the deeper loading of the last season or two has been not from hogging, but from sagging strains, showing in compression on the upper deck, from which the wood deck is universally omitted. Much of this can be avoided by more care in getting the cargo into the ends of the ship, and intercostal stiffening and ties under the beams, cheaply and easily applied, will take care of the rest.

Altogether there seems to be no occasion for the owners of the modern steel tonnage to be alarmed. W. I. BABCOCK.

Chicago, April 2, 1897.

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As finally passed by the house the naval appropriation bill makes appropriations for three battleships, a cruiser for the lakes, and twelve, instead of six, torpedo boats and torpedo boat destroyers. The recommendation of the naval committee, which was for only three torpedo boats and three destroyers, has thus been doubled. The four new dry docks recommended by the naval committee are also retained in the bill, but the proposed survey for a new dock at Galveston was ruled out of order.

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Invitations from the Globe Iron Works Co., Cleveland, fix Saturday, April 9, 2:30 p. m., as the time for launching the steel schooner David Z. Norton, building for the Wilson Transit Co. of Cleveland. Mr. Norton is a member of the firm of Oglebay, Norton & Co., dealers in iron ore. At Lorain on Wednesday next the Cleveland Ship Building Co. will launch the steamer Superior City, building for A. B. Wolvin and others. The passenger steamer America, intended for service between Michigan City and Chicago, was launched from the Wyandotte yard of the Detroit Dry Dock Co. on Saturday last.

MARINE REVIEW

DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, Ohio, by John M. Mulrooney and F. M. Barton.

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**The books of the United States treasury department on June 30, 1897, contained the names of 3,230 vessels, of 1,410,102.60 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1897, was 399, and their aggregate gross tonnage 769,366.68; the number of vessels of this class owned in all other parts of the country on the same date was 314, and their tonnage 685,709.07, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1897, was as follows:**

| | Number. | Gross Tonnage. |
|---|---|---|
| Steam vessels | 1,775 | 977,235.45 |
| Sailing vessels and barges | 1,094 | 394,888.87 |
| Canal boats | 361 | 37,978.28 |
| Total | 3,230 | 1,410,102.60 |

**The gross registered tonnage of the vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:**

| | | |
|---|---|---|
| Year ending June 30, 1893 | 175 | 99,271.24 |
| " " " 1894 | 106 | 41,984.61 |
| " " " 1895 | 93 | 36,352.70 |
| " " " 1896 | 117 | 108,782.38 |
| " " " 1897 | 120 | 116,936.98 |
| Total | 611 | 403,327.91 |

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (From Official Reports of Canal Officers.)

| | St. Mary's Falls Canals. | | | Suez Canal. | | |
|---|---|---|---|---|---|---|
| | 1897 | 1896 | 1895 | 1897 | 1896 | 1895 |
| Number of vessel passages | 17,171 | 18,615 | 17,956 | 2,986 | 3,409 | 3,434 |
| Tonnage, net registered | 17,619,933 | 17,249,418 | 16,806,781 | 7,899,374 | 8,560,284 | 8,448,383 |
| Days of navigation | 234 | 232 | 231 | 365 | 365 | 365 |

When President McKinley took up, several days ago, the question of investing $7,000,000 of the $50,000,000 special war appropriation in the construction of 100 torpedo boat destroyers and torpedo boats, he found the navy department ready on very short notice with plans for hulls and machinery. The contracts can be let in a hurry if peace negotiations with Spain prove fruitless. This proposition arose as a result of the failure of the government agents to purchase a satisfactory number of these vessels. In view of this fact Secretary Long directed Chief Naval Constructor Hichborn and Engineer-in-Chief Melville to report to him the number, displacement and cost of torpedo boat destroyers and torpedo boats which should be built by this government. The report recommends the construction of about thirty destroyers of from 325 to 350 tons displacement, capable of making a maximum speed of 30 knots an hour and to be built within a period of four or five months. The torpedo boats are to be of about 100 tons displacement and capable of making 20 to 22 knots. These boats must be completed in ninety days. As the department has received proposals from ship builders all over the country as to what they are willing to do and as the report of the chief constructor and engineer-in-chief is based on these proposals, there is no likelihood that there will be any difficulty in placing the contracts if the vessels are required.

New ships being added to the fleets of the North German Lloyd and Hamburg-American lines are all of the best type. The latest addition to the Hamburg-American fleet arrived in New York, a few days ago, from the works of Harland & Wolff, Belfast. Her name is Brasilia. She is a twin-screw vessel of 10,961 tons gross, with a cargo capacity of 15,000 tons and accommodations for 600 steerage passengers. She is 500 feet long on the water line, 62 feet beam, with 38 feet depth of hold. The Hamburg-American line has four other vessels of similar type and dimensions under construction, the Belgia, Bulgaria, Belgravia and Batavia. In addition the company has building the Patricia and the Pavia, sisterships of the Pennsylvania, the Assyria, the Syria and the Sardinia. The company has, moveover, just purchased fourteen steamers of the King Sin line, which runs from Germany to the Far East. It is stated that the Hamburg-American line and the North German Lloyd have decided to operate a joint service from Germany to the east, and that in addition to the fleet just acquired the Hamburg-American line will build two mail steamers.

Among seagoing tugs purchased by the navy department during the past few weeks under pressure of war preparations is the R. W. Wilmot, built recently by F. W. Wheeler & Co. of West Bay City for New Orleans parties, and sent to the coast by way of the Canadian canals. The secretary of the navy has decided upon these names for yachts and tugs thus far purchased: The yacht Alicia will be called the Hornet, the yacht Almy, the Eagle, and the yacht Hermione the Wasp. The tug E. F. Luckenbuck will be known as the Tecumseh; the Walter A. Luckenbuck as the Uncas; the Winthrop as the Osceola; the P. H. Wise as the Sioux; the De Witt C. Ivins as the Nezinscot, and the El Toro as the Algonquin. The German torpedo boat purchased several days ago will be named Somers. The Mayflower will not be renamed.

An architect for a house may build his house too strong and so heavier than it need be, but Mother Earth is patient and bears the added weight without protest. But build your ship too strong, and you lose in cargo carrying capacity; build her too light and Old Ocean will surely find her weaknesses. A few wiseacres and men whose limit is what has been done, shake their heads when the water tubular boiler is advocated, but the same courage and persistence that have made the triple engine and the high-pressure boiler safe, reliable servants in every-day use, will most certainly develop the water tube boiler and make it the boiler of the future. The fast ships to come will have this boiler, forced draught and fast running engines. As to the use of new metals for ship construction, steel seems destined to hold its own.—Lewis Nixon.

Capital stock of the Lorain Steel Co., which is to succeed the Johnson company at Lorain, is $14,000,000, consisting of $5,000,000 first mortgage 5 per cent. gold bonds, $3,000,000 of culminative preferred stock and $6,000,000 of common stock. Officers are practically the same. The Johnson company continues to operate the present plant until Dec. 31, 1898, during which time the new company hopes to complete two blast furnaces, coke ovens and other improvements, including a new blooming mill.

Mr. Isham Randolph, chief engineer of the Chicago drainage canal, has estimated that the cost of the work remaining to be done and not contracted will be approximately as follows: Tail race, Lockport, $90,000; from tail race to upper basin, $150,000; construction and right of way through Joliet, $1,760,000; movable bridges for railroads and hignways, $1,153,724; Chicago river improvements, $386,000; total, $3,539,724.

Mr. G. G. Tunell, statistician, of Chicago, has been engaged, since preparing a report of lake commerce for the treasury department, in assisting the committee appointed by the Indianapolis monetary convention in the preparation of their report, which will be a document of over 500 large pages.

Both houses of congress have finally passed the bill providing for the payment of $330,000 to the heirs of John Roach, the ship builder, on a claim that has been pending a dozen years. The bill will very probably receive the approval of the president.

Senator McMillan of Michigan has introduced another bill (S. 4278) providing for the erection of a bridge across the Detroit river at Detroit. The bill has been referred to the committee on commerce, of which Senator McMillan is a member.

## Ship Building During the Last Quarter.

During the quarter ended March 31 (winter season) there was practically no launching of vessels on the great lakes. The report of the commissioner of navigation regarding vessels launched during that period does not, therefore, make a very good showing. It is as follows:

VESSELS BUILT AND OFFICIALLY NUMBERED IN THE UNITED STATES, QUARTER ENDED MARCH 31, 1898.

| | Wooden Vessels. | | | | Steel Steam Vessels. | |
|---|---|---|---|---|---|---|
| | SAIL. | | STEAM. | | | |
| | No. | Gross tons. | No. | Gross tons. | No. | Gross tons |
| Atlantic and gulf coasts | 39 | 3,828 | 27 | 1,993 | 6 | 2,400 |
| Pacific coast | 8 | 349 | 10 | 1,881 | ..... | ..... |
| Great Lakes | ..... | ..... | 1 | 73 | ..... | ..... |
| Western rivers | ..... | ..... | 20 | 2,440 | ..... | ..... |
| Total | 47 | 4,177 | 58 | 6,387 | 6 | 2,400 |

SUMMARY.

| | Quarter ended March 31, 1898. | | Quarter ended Dec. 31, 1897. | |
|---|---|---|---|---|
| | No. | Gross tons. | No. | Gross tons. |
| Total sail | 47 | 4,177 | 117 | 5,975 |
| Total steam | 64 | 8,787 | 68 | 12,414 |
| Grand Total | 111 | 12,964 | 185 | 18,389 |

There were no iron vessels built during the last quarter. The steel vessels built were all steam vessels.

## Lumber Freights During Twenty Years Past.

Publications pertaining to lake commerce contain little in the way of statistics of freight rates on lumber. In his report of lake commerce made to the United States treasury deparment recently, Mr. G. G. Tunell presents the following figures on this score:

FREIGHT RATES ON LUMBER (PER 1000 FEET) FROM ALPENA, MANISTEE, MENOMINEE, ASHLAND, AND DULUTH, TO CHICAGO BY LAKE.*

| Year. | Alpena. | Manistee. | Menominee. | Ashland. | Year. | Alpena. | Manistee. | Menominee. | Ashland. |
|---|---|---|---|---|---|---|---|---|---|
| 1877 | $1.31 | $1.27 | ..... | ..... | 1888 | $1.90 | $1.49 | $1.57 | $2.73 |
| 1878 | 1.14 | 1.34 | $1.46 | ..... | 1889 | 1.59 | 1.42 | 1.40 | 2.42 |
| 1879 | ..... | 1.77 | $1.87 | ..... | 1890 | 1.74 | 1.58 | 1.66 | 2.51 |
| 1880 | 2.22 | 2.12 | 2.27 | ..... | 1891 | 1.69 | 1.59 | 1.59 | 2.44 |
| 1881 | ..... | 2.18 | 2.17 | ..... | 1892 | 1.81 | 1.62 | 1.67 | 2.91 |
| 1882 | 1.92 | 1.78 | 1.80 | ..... | 1893 | 1.61 | 1.46 | 1.48 | 2.36 |
| 1883 | 2.01 | 1.85 | 1.85 | ..... | 1894 | 1.41 | 1.32 | 1.33 | 2.00 |
| 1884 | 1.74 | 1.70 | 1.59 | ..... | 1895 | 1.36 | 1.22 | 1.27 | 2.18 |
| 1885 | 1.64 | 1.46 | 1.54 | ..... | 1896 | 1.16 | 1.14 | 1.20 | 1.85 |
| 1886 | 1.89 | 1.58 | 1.66 | $2.12 | 1897 | 1.18 | 1.13 | 1.10 | 1.67 |
| 1887 | 2.53 | 1.94 | 2.11 | $3.15 | | | | | |

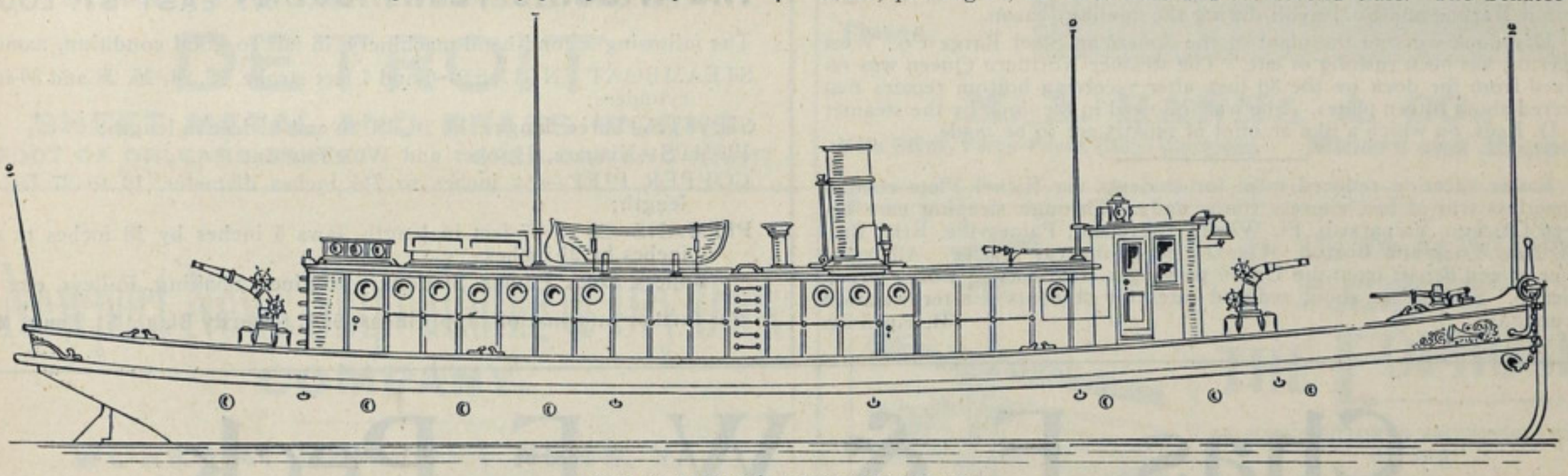
*The rates from Duluth, Superior and the other ports at the head of Lake Superior are almost always the same as those from Ashland.

## Chicago's New Fireboat.

Bids were opened in Chicago, a few days ago, for the construction of another fire boat for that city. An appropriation of $70,000 is provided for the boat and it is also proposed to spend $20,000 for new pipe lines to run through business sections of the city from the lake. Bids submitted for construction of the new boat were as follows: Racine Boat Works, Racine, Wis., $69,000; Chicago Ship Building Co., $68,500; Globe Iron Works Co., Cleveland, $57,882; Craig Ship Building Co., Toledo, $48,950. There is certainly a wide range to choose from in this collection of bids. The highest is full $20,000 above the lowest.

This boat will be one of the finest fire fighters in the country. Plans and specifications were very complete in detail and admirably prepared. This part of the work was done under contract with Mr. A. W. Goodrich, the contract also including inspection of the vessel while under construction. Dimensions of the hull, which is to be of steel, are: Length over all, 118 feet; length between perpendiculars, 107 feet; beam, molded, 24 feet; depth of hold from top of beam to top of floor plate, 11 feet 9 inches; depth, molded, 12 feet 6 inches; draught, 9 feet. There are to be four athwartship water-tight bulkheads, one water-tight deck aft and one forward, dividing the vessel into seven water-tight compartments. Coal bunker bulkheads, which extend the whole length of the boiler room, are also to be water-tight, forming a cofferdam in the midship part of the vessel. A steel deck house on the main deck will be 69 feet long and 6½ feet high at the sides. In this deck house will be the pilot house, hose room abaft it, and stoke hold and engine room. Under the main deck aft will be a small workshop for engineers. Forward of this and in the order named will be the engine room, boiler room and coal bunkers, and the forecastle in which steam steerer and bath room will be located.

Engines are to be vertical inverted double-cylinder non-condensing, with two cranks and having cylinders of 20 inches diameter and 20-inch stroke, built for 140 pounds working pressure. The propeller is to be of cast steel, four bladed, solid, 8 feet diameter and 10 feet pitch. There are to be two vertical Worthington admiralty type duplex feed pumps, with cylinders 9 by 5¼ by 10 inches, and a duplex sanitary pump with cylinder



PLAN OF CHICAGO'S LATEST FIRE BOAT.

4½ by 2¾ by 4 inches; also two cylindrical furnace flue boilers, 12 feet diameter and 11 feet length, built for a working pressure of 140 pounds.

Three fire pumps to be installed in this vessel will weigh with appurtenances about twenty tons, and will have a combined capacity of 9,000 gallons per minute. They are to be double-acting, vertical, simple, duplex, crank and fly-wheel pumps. Steam cylinders are to have a bore of 17 inches and a stroke of 11 inches, and to be fitted with piston valves; water cylinders to have a bore of 10 inches and a stroke of 11 inches. Following are the test requirements: "The pumps shall be capable of withstanding a hydrostatic pressure of 350 pounds per square inch, and the steam cylinders shall be capable of withstanding a working pressure of 140 pounds per square inch. The pumps shall be tested by running separately and together, and each shall be required to discharge not less than 3,000 United States gallons per minute against a working pressure of 170 pounds per square inch, with a steam pressure in the boilers of not less than 125 pounds per square inch; the discharge to be figured by the plunger displacement, less 3 per cent. allowance for slip, making a total of 9,000 gallons per minute."

## Stocks of Grain at Lake Ports

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes, April 2, 1898:

| | Wheat, bushels. | Corn, bushels. |
|---|---|---|
| Chicago | 6,434,000 | 16,661,000 |
| Duluth | 3,510,000 | 3,223,000 |
| Milwaukee | 109,000 | 104,000 |
| Detroit | 80,000 | 70,000 |
| Toledo | 243,000 | 1,166,000 |
| Buffalo | 678,000 | 370,000 |
| | 11,054,000 | 21,594,000 |

As compared with a week ago, the above figures show, at the several points named, an increase of 73,000 bushels of wheat and a decrease of 627,000 bushels of corn. On the same date there was afloat at Chicago 1,420,000 bushels of wheat, 6,927,000 bushels of corn, 232,000 bushels of oats and 307,000 bushels of rye; at Buffalo 18,000 bushels of wheat; and at Milwaukee 536,000 bushels of corn.

The Providence (R. I.) Journal of Commerce Co. is compiling a "United States Commercial Directory for Use in Foreign Countries." It will be printed in English, German, French and Spanish.

## Naval Fleets of the World.

The following comparison of the principal naval fleets of the world was prepared recently by Richard Clover, chief intelligence officer of the navy. The list includes vessels building or ordered. Among the battleships are included all vessels which might be employed in the line, namely, battleships, sea-going coast-defense vessels, first-class monitors and large armored cruisers:

| Country. | Battleships. | Coast-defense vessels. | Cruisers. | Torpedo boats. |
|---|---|---|---|---|
| Great Britain | 80 | 60 | 133 | 308 |
| France | 51 | 26 | 57 | 269 |
| Russia | 40 | 34 | 25 | 187 |
| Italy | 28 | .. | 18 | 208 |
| Germany | 28 | 13 | 23 | 152 |
| United States | 18 | 13 | 27 | 23 |
| Japan | 11 | 6 | 19 | 40 |
| Spain | 14 | 13 | 20 | 61 |

The second-class battleship Maine, lost recently at Havana, is not included in the foregoing list.

## Ship Building on the Pacific.

Mr. Irving M. Scott of the Union Iron Works sends the Review a few notes about two passenger and freight steamers—Senator and St. Paul—recently launched at the San Francisco works. It would seem from the short time spent on these vessels that the large amount of naval work under way at San Francisco has not interfered with the rapid construction of new merchant ships. On Nov. 27, 1897, the work of preparing a berth and slip for the Senator was begun. She was launched March 19, 1898, or in less than four months. Following are leading particulars of this vessel: Length, 280 feet; beam, 38 feet; depth, moulded, 21 feet; gross register tonnage, 2,200; indicated horse power 1,800; speed, 13 knots; passengers, 110 first class and 300 second class. The Senator is being built for the Pacific Coast Steamship Co.. The second steamer, the St. Paul, built for the Alaska Commercial Co., was launched yesterday, the 6th inst. The berth from which she was launched was vacated Jan. 28, or little more than two months ago. Leading particulars of the St. Paul are: Length on water line, 280 feet; length over all, 292 feet 6 inches; breadth, 38 feet; depth of hold, 19 feet 7 inches; gross tonnage, 2,000; speed, 13 knots; indicated horse power, 1,800; passengers, 257 cabin and 300 second class. As the hull plates for these ships were made in Pittsburg, this rapid work in San Francisco is all the more important.

Capt. Geo. W. Brown, manager of the Eophone Co., New York, has been in Detroit and Cleveland within the past few days making arrangements for equipping several lake vessels with eophones—instruments for detecting the direction of sound. Capt. Brown was a commander of vessels in the late war and also lived in Cuba two years. On this account he thought it a duty to offer his services as commander of an auxiliary cruiser in event of trouble with Spain. The offer is commendable, as Capt. Brown is well fitted for the work of pushing the eophone enterprise, which must be sacrificed in event of war. The government steamers Marigold and Fessenden have recently been fitted with these instruments. They are to be supplied also to the two revenue cutters building in Cleveland and to the Northern line passenger steamers North West and North Land, as well as one of the side-wheel steamers on the Mackinaw division of the Detroit & Cleveland Steam Navigation Co. Appropriations for eight eophones for vessels of the revenue cutter service were made in the last sundry civil appropriation bill, and the present bill contains appropriations for six more. It would seem that these instruments would be especially valuable on such vessels as those of the Goodrich company, Cleveland & Buffalo line, and the Flint & Pere Marquette car ferry.

The Detroit Electric Wiring & Repair Co. is engaged in installing electric lighting equipments in six vessels. At present they are working on the side-wheel passenger steamer City of Erie, building at Detroit. Recent work of this company is represented in the lake steamers City of Buffalo, Aragon, Senator, Sir Wm. Fairbairne, Robert Fulton, Venezuela and Appomattox, and the New London Steamship Co.'s Mohawk and Mohegan, built at Roache's ship yard, Chester, Pa.

## Around the Lakes.

Donoghue Bros. are about to erect an 80,000-bushel elevator at Kingston, Ont., in the rear of their present house.

Mr. C. F. Bielman of Detroit has again secured the Detroit river mail service contract, and his small steamer, the Florence B., will be engaged in the work.

Hickler Bros. have secured the contract for removing the miter sill of the old movable dam in the St. Mary's Falls canal and will endeavor to complete the work before May 1.

Capt. Andrew Hackett at Bois Blanc island reports that the draught of water in that part of the Detroit river during the past few days has ranged from 17 feet 6 inches to 18 feet 1 inch.

The tug which the Goodrich Transportation company proposes to have built at Manitowoc will be 107 feet long between perpendiculars, 118 feet long over all, 24 feet beam and 11 feet 9 inches molded depth.

A steel barge 180 by 36 by 12 feet, built for the Montreal Transportation Co., was launched at Kingston a few days ago, and named Brighton. Another vessel of the same kind, also under construction at Kingston, has been named Cobourg.

"Cut Loose for the Season" is the title of the latest novel advertising card issued by Passenger Agent Herman of the Cleveland & Buffalo line. It is a card announcing the opening of the C. & B. service for 1898. Strings holding three steamers of the line are being cut by a hand bearing a large scissors.

The steel steamer Globe will be managed in the office of M. A. Hanna & Co. this season. She will be commanded by Capt. A. C. Chapman, who has sailed the Hanna steamer Grecian for a number of years. Capt. William Baxter, who was in the German, will take the Grecian, and Capt. James Nicholson will sail the German.

Gen. Manager T. F. Newman of the Cleveland & Buffalo Transit Co. confirms the report of charter of the side-wheel steamer State of Ohio to the Connors Transportation Co. of Chicago, but reserves information as to the consideration involved. The Ohio will run between Chicago, Benton Harbor and St. Joseph during the coming season.

Dry dock work at the plant of the American Steel Barge Co., West Superior, has been rushing of late. The steamer Northern Queen was removed from the dock on the 3d inst. after receiving bottom repairs that covered about fifteen plates. She was followed in the dock by the steamer W. D. Rees, on which a like amount of repairs are to be made.

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DRY GOODS
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MERCHANDISE

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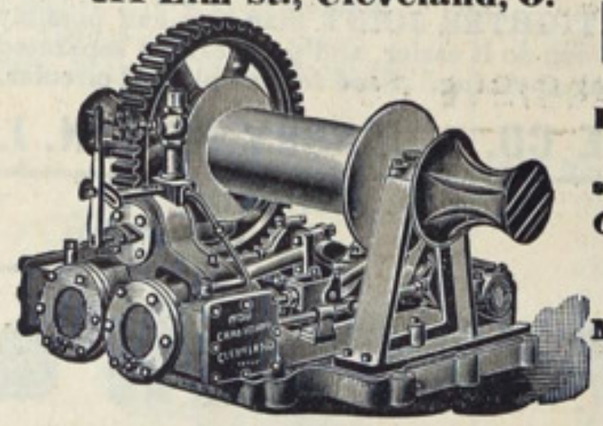
GRAND AVE. & THIRD ST.

# The Chase Machine Co.

**111 Elm St., Cleveland, O.**



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MANUFACTURERS OF

**Land and Marine Engines and Steam Pumps,**

SOLE OWNERS AND MANUFCTURERS OF

***Chase Fog Whistle Machine.***

Over 150 in use on the best class of Lake Steamers.

Special Attention given to

**MARINE REPAIR WORK.**

Engineers' Supplies.
Asbestos Pipe and Boiler Covering.

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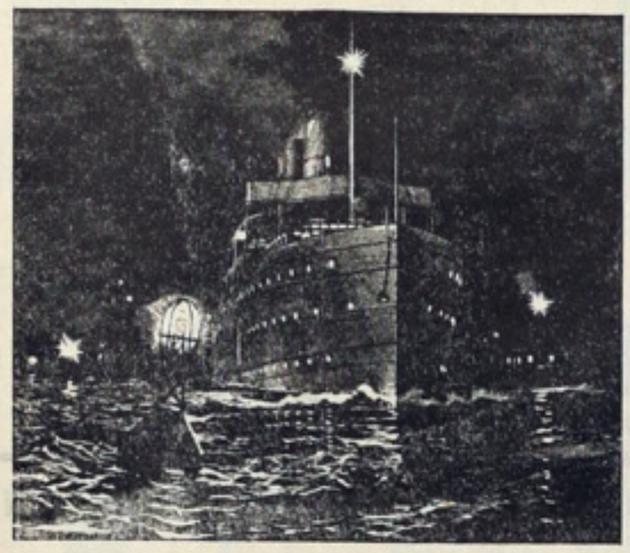

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**Burn Continuously** from 80 to 365 days and nights without attention, and can be seen a distance of six miles.

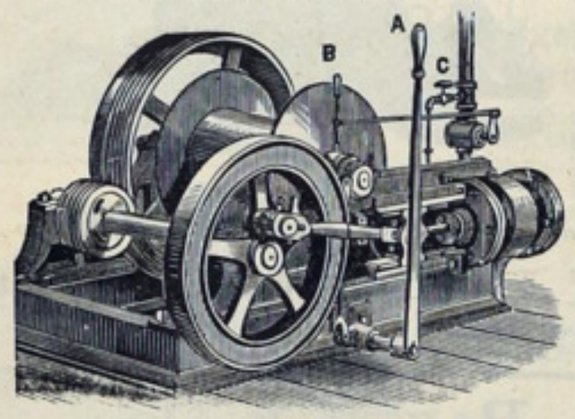
**Brilliant and Steady Illumination.**

**Economical and Reliable in Operation.**

Controlled by the **SAFETY CAR HEATING AND LIGHTING CO.,**
**160 Broadway, New York City.**

# WILLIAMSON BROS.

**Cor. Richmond and York Sts., PHILADELPHIA, PA.**

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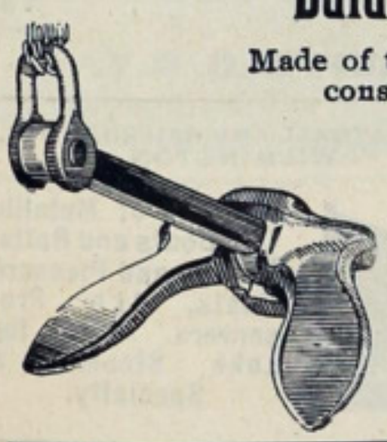
# Baldt Patent Stockless Anchor.



**Made of the finest quality of open-hearth steel and constructed on the ball and socket principle.**

**Many points of superiority over ordinary Stockless Anchors.**

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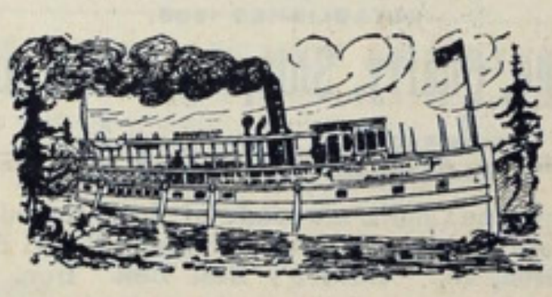
**Representative for the Great Lakes.**

☞New catalogue containing valuable tables sent on application.

**For Sale.**



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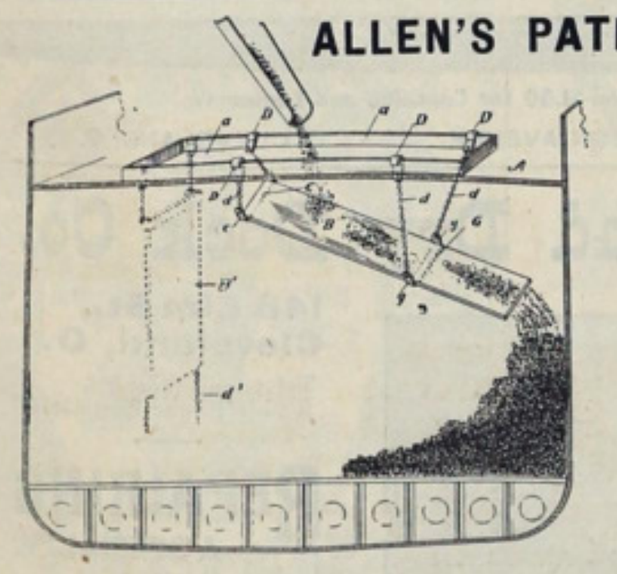

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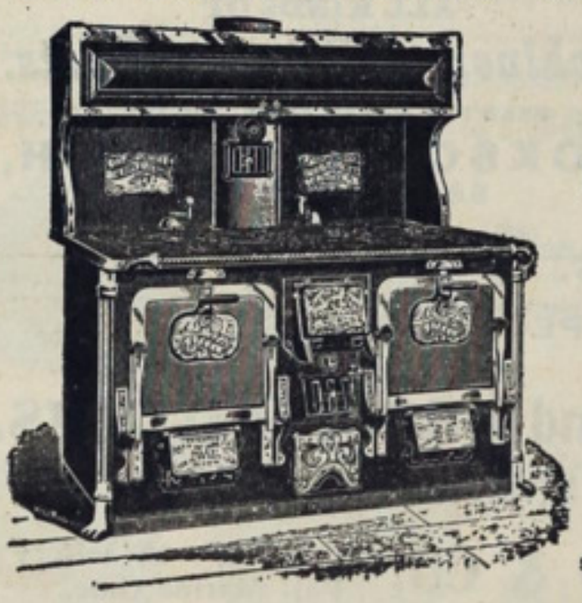

**MOST PERFECT MARINE RANGE MADE.**

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MADE IN ALL SIZES

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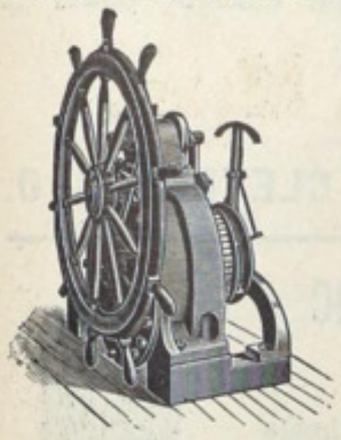
## Queen City Hydraulic Steerer.



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FOR TUGS, STEAMERS, ETC.

Price—From $650 to $750, according to size and location in steamer.

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Engine Bells and Brass Work of all descriptions, Shrieking and Siren Whistles.

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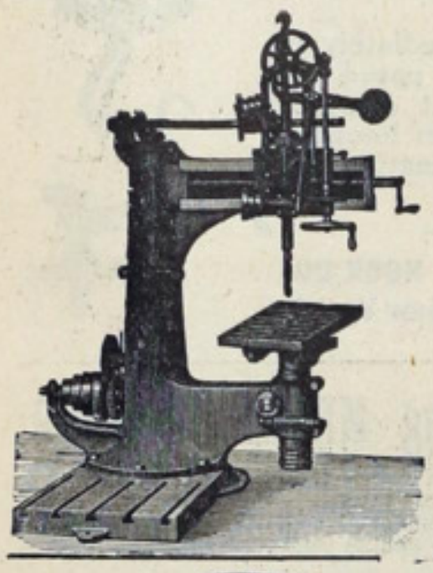

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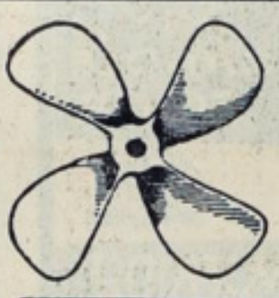

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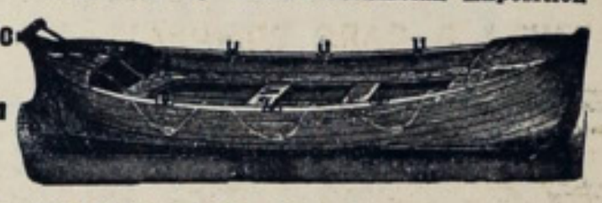

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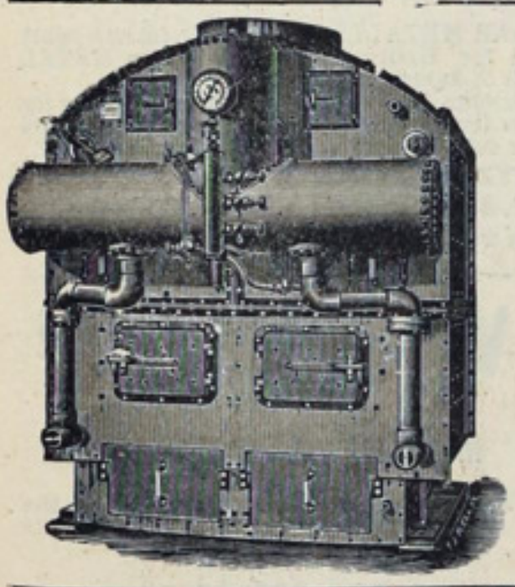

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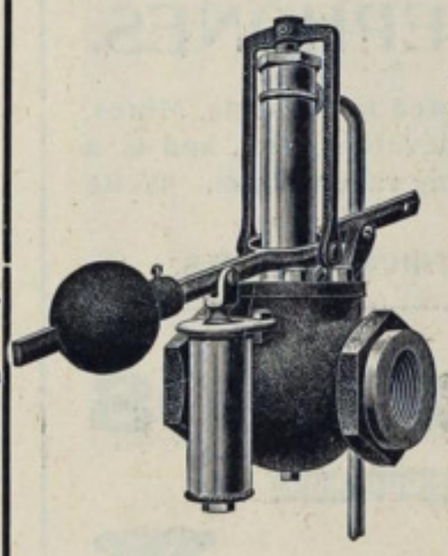

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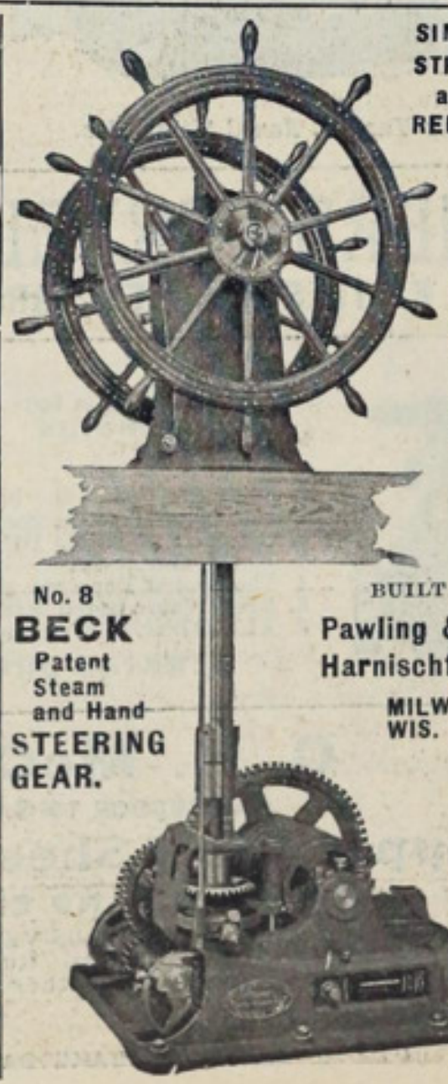

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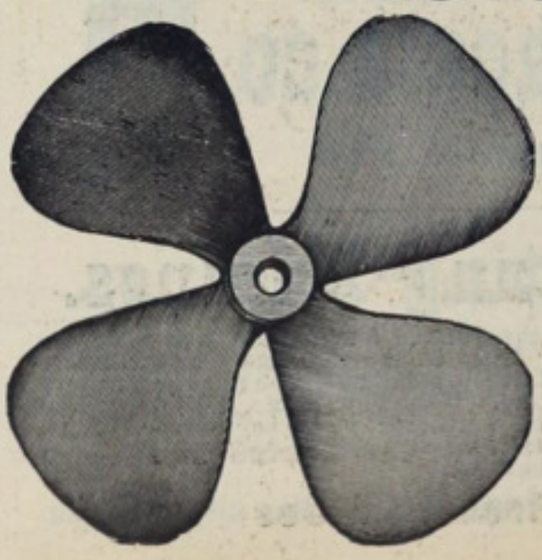

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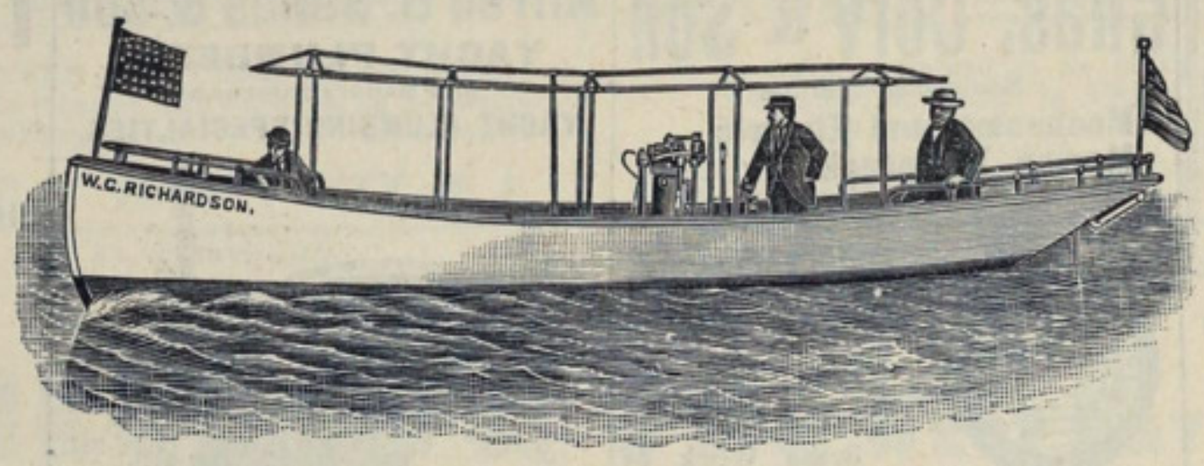


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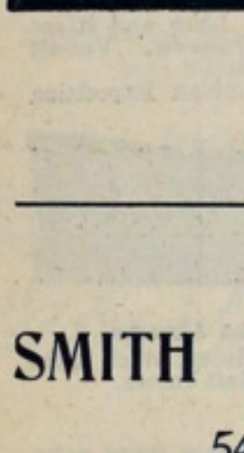

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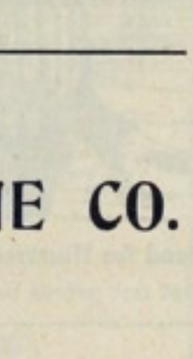

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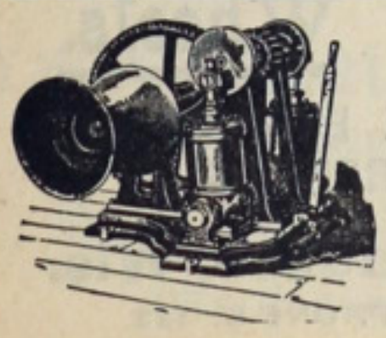

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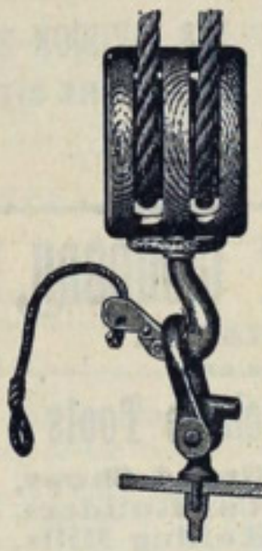

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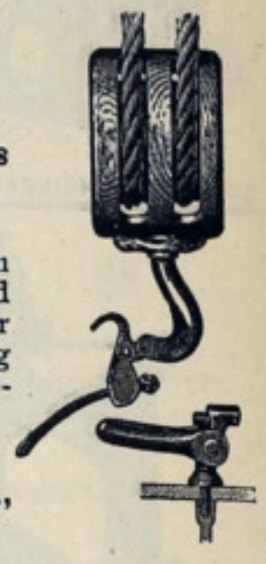

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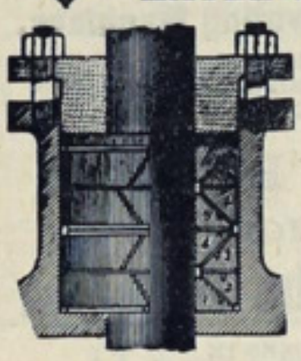

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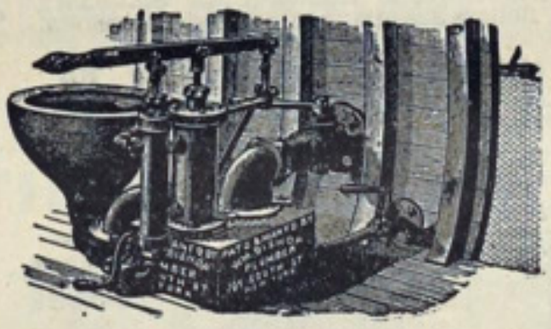

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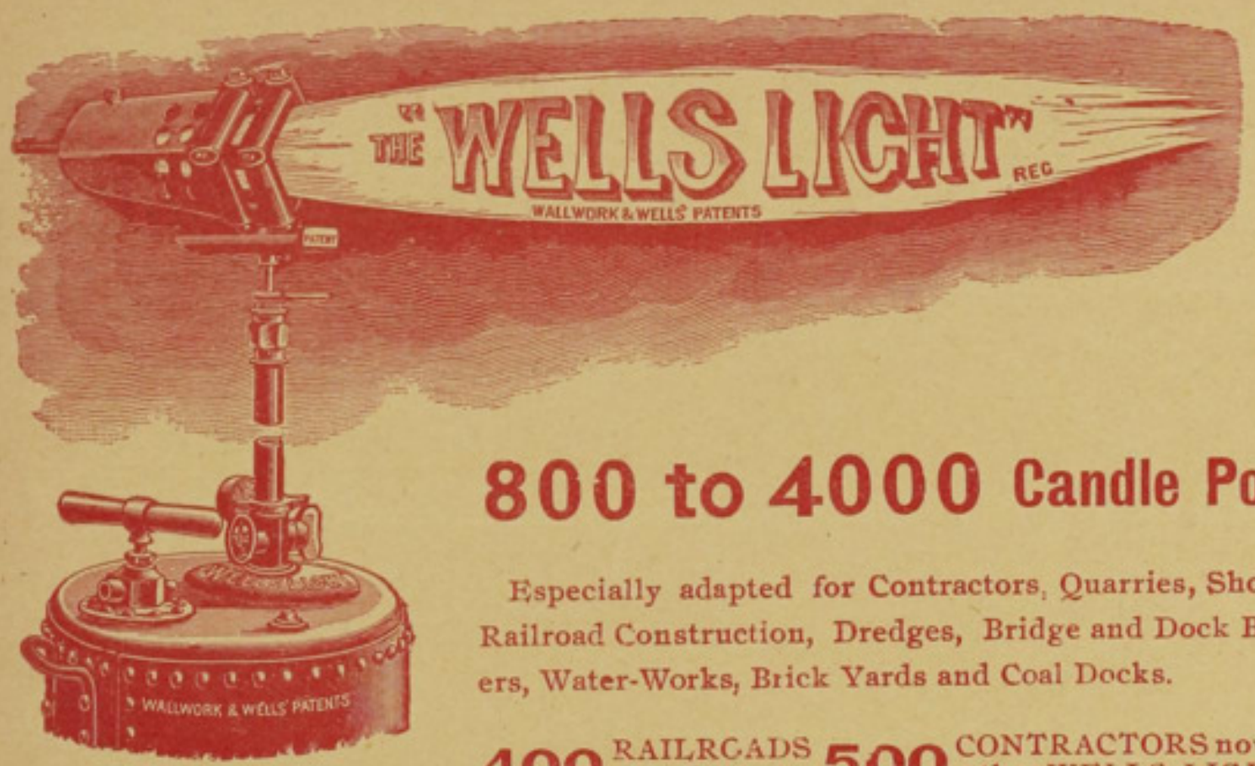


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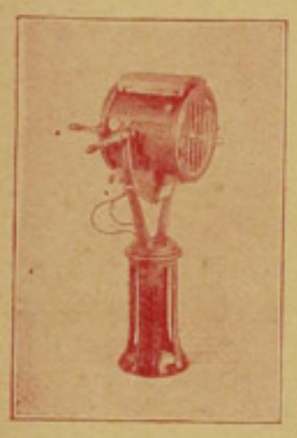

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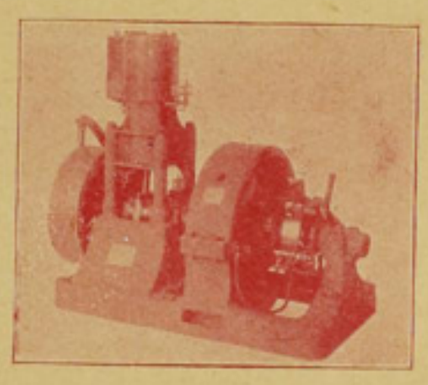

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